

Response  
Serial No. 09/435,668  
Page 5

### REMARKS

By this Preliminary Response, claims 1-4 and 6-12 are amended (claim 5 has been previously canceled) to more clearly define the Applicant's invention and not in response to prior art.

In view of the above amendments and the following discussion, the Applicant respectfully submits that none of these claims now pending in the application are anticipated under the provisions of 35 U.S.C. §102. Thus, the Applicant believes that all of these claims are in allowable form.

### Rejections

#### **A. 35 U.S.C. §102(b)**

In the prior Office Action, the Examiner rejected claims 1-4, and 6-12 under 35 U.S.C. §102(b) as being anticipated by U.S. Patent 5,524,092, issued June 4, 1996 (hereinafter "Park"). The rejection is deemed moot with respect to the amended claims presented in this Preliminary Response.

"Anticipation requires the presence in a single prior art reference disclosure of each and every element of the claimed invention, arranged as in the claim." *Lindemann Maschinenfabrik GmbH v. American Hoist & Derrick Co.*, 221 USPQ 481, 485 (Fed. Cir. 1984) (emphasis added). The Applicant respectfully submits that Park fails to teach, suggest or disclose each and every element of the claimed invention as arranged in the Applicant's claims.

Applicant's claim 1 recites

1. In a surface emitting laser, an upper mirror structure comprising a stack of dielectric layers of alternating high and low indices of refraction capped with a layer of metal, the improvement comprising a layer consisting of tin oxide to which the metal capping layer is directly adhered for improving adhesion of the metal capping layer to the stack of dielectric layers, the upper mirror structure disposed over a light emitting structure and a lower mirror structure.

It is respectfully submitted that no new matter has been entered by virtue of the

335742\_1

Response  
Serial No. 09/435,668  
Page 6

amended claim language. Specifically, support for the lower mirror structure is presented at page 4, lines 3-6 of Applicant's specification; support for the light emitting structure is presented at page 4, lines 7-12 of Applicant's specification, and support for the upper mirror structure is presented at page 4, lines 13-22 of Applicant's specification.

It is evident that the Applicant's invention is directed, at least in part, to an improved optical device, and more particularly, a vertical-cavity surface emitting laser as introduced at page 3, lines 17-20 of Applicant's specification. The subject surface emitting laser having the improvement of an upper mirror structure having a stack of dielectric layers of alternating high and low indices of refraction capped with a metal layer wherein a layer consisting of tin oxide is directly adhered to the metal layer for improved adhesion of the metal layer to the dielectric layer stack. The Park reference fails to teach, suggest or disclose such improvement. More specifically, the Examiner alleges that FIG. 2 of Park teaches a mirror as claimed and taught by the Applicant. However, Park does not teach, suggest or disclose a surface emitting laser with an upper mirror structure having a layer of tin oxide directly adhered to a metal capping layer wherein such upper mirror structure is disposed over a light emitting structure and a lower mirror structure. Park instead teaches a multilayered ferroelectric-semiconductor memory-device. In detail, Park teaches a ferroelectric-semiconductor interface memory diode consisting of "a layer of metal electrode, a layer of diffusion barrier conductor, a layer of ferroelectric material, a layer of semiconductor crystal, and a layer of metal electrode" and further teaches a ferroelectric-semiconductor interface memory element consisting of "a layer of metal electrode, a layer of diffusion barrier conductor, a layer of ferroelectric material, another layer of diffusion barrier conductor, a layer of semiconductor crystal, and a layer of metal electrode." (See Park, Abstract). There is absolutely no teaching, suggestion or disclosure in Park of a surface emitting laser having the upper mirror structure as claimed (having the tin oxide layer adhered to the metal capping layer) disposed over a light emitting structure and a lower mirror

335742\_1

Response  
Serial No. 09/435,668  
Page 7

structure. That is, since Park is not teaching a surface emitting laser and its attendant components, but rather a ferroelectric-semiconductor memory device, the overall structure, and disclosed elements of Park are completely different from that of the subject invention. As such, Park does not teach each of claimed clients as arranged in the claimed invention.

For at least the reasons stated above, the Applicant submits that claim 1 is not anticipated by the teachings of Park and, as such, fully satisfies the requirements of 35 U.S.C. §102 and is patentable thereunder. Additionally, independent claims 6 and 8 recite similar features to those recited in claim 1. As such, the Applicant submits that independent claims 6 and 8 are also not anticipated by the teachings of Park and also fully satisfy the requirements of 35 U.S.C. §102 and are patentable thereunder for at least the same reasons offered with respect to claim 1. The Applicant reserves the right to establish the patentability of each of the claims individually in subsequent prosecution.

Furthermore, dependent claims 2-4, 7 and 9 -12 depend either directly or indirectly from independent claims 1 and 8 and recite additional features therefor. As such and for at least the reasons set forth herein, the Applicant submits that dependent claims 2-4, 7 and 9 -12 are also not anticipated by the teachings of Park. Therefore the Applicant submits that dependent claims 2-4, 7 and 9 -12 also fully satisfy the requirements of 35 U.S.C. §102 and are patentable thereunder.

**B. 35 U.S.C. §102(b)**

In the prior Office Action, the Examiner rejected claims 1-4, 7, 8, 11 and 12 under 35 U.S.C. §102(b) as being anticipated by U.S. Patent 5,780,174, issued July 14, 1998 (hereinafter "Tokito"). The Examiner alleges that regarding claim 1, "Tokito et al. disclose a metal capped mirror, Fig. 1, comprising a stack of dielectric layers 12 of alternating high and low indices of refraction capped with a layer of metal 22, the improvement comprising a layer 14 consisting of tin oxide to which the metal capping

335742\_1

Response  
Serial No. 09/435,668  
Page 8

layer 22 is directly adhered.” The Applicant respectfully disagrees.

As evident from the discussion above, Applicant's invention is directed, at least in part, to an improvement in an upper mirror structure having a stack of dielectric layers of alternating high and low indices of refraction capped with a layer of metal, “the improvement comprising a layer consisting of tin oxide to which the metal capping layer is directly adhered for improving adhesion of the metal capping layer to the stack of dielectric layers”. The Tokito reference fails to teach, suggest or disclose an improvement to a metal capped mirror claimed. More specifically, the Examiner alleges that the metal capped mirror of Tokito (FIG. 1) comprises a stack of dielectric layers 12 of alternating high and low indices of refraction capped with a metal layer 22 and also having a layer 14 consisting of tin oxide to which the metal capping layer is directly adhered for improving adhesion of the metal capping layer to the stack of dielectric layers. The Applicant respectfully indicates that the Examiner has improperly interpreted Tokito. Specifically, the reference clearly shows in each of FIGs. 1-4, a lower mirror structure, (layer 12) and a light emitting layer (luminous layer 16). However, it is offered that the proposed tin oxide layer (layer 14) of Tokito is not directly adhered to the alleged metal capping layer 22 of Tokito. That is, in each instance shown in FIGs. 1-4 as described above, there are intervening layers (any one of layers 16, 18 and/or 20 depending upon which figure is reviewed) that are interposed between layer 14 and alleged metal capping layer 22. As evident from at least the portions of the disclosure of Tokito described above, the metal mirror is formed and adhered to either an electron transport layer or a luminous layer and not to what the Examiner considers a layer of tin oxide. More specifically, layer 14 is identified as a transparent conductive layer. This is in direct contrast to Applicant's invention which claims “a layer consisting of tin oxide to which the metal capping layer is directly adhered”. Accordingly, Tokito does not show all of the claimed elements as arranged in the claim.

It is noted that in the Examiner's Final Office Action, Response to Arguments Section 5c, the Examiner indicated that Tokito discloses a layer of tin oxide directly

335742\_1

Response  
Serial No. 09/435,668  
Page 9

adhered to the metal layer through the transparent conductive layer (layer 14)." In response, it is respectfully submitted that there is a specific connotation and understanding of the word "directly" when referring to the physical disposition of two elements. That is, there are no intervening elements between two elements that are associated directly. The American Heritage Desk Dictionary defines the word "directly" to be, among other things, "without anything or anyone intervening". With respect to the subject invention and the specific disclosure, FIG. 1, 2 and 3 all show the direct physical relationship of the metal capping layer 52 to either the sapphire layer 60 or its direct replacement on page 5, lines 1-9 with tin oxide. Therefore, for the Examiner to say that there is a direct adherence of the tin oxide layer to the metal layer through the transparent conductive layer, improperly extends the definition of the word "directly". Such improper interpretation of the reference and the specific use of and interpretation of the word "directly" is insufficient to further substantiate the anticipation objection.

For at least the reasons stated above, the Applicant submits that the teachings of Tokito do not teach, suggest or disclose the invention of the Applicant at least with respect to claim 1. That is, Tokito fails to teach, suggest or disclose each and every element of the claimed invention as arranged in the Applicant's claims as required for anticipation. Therefore, the Applicant submits that claim 1 is not anticipated by the teachings of Tokito and, as such, fully satisfies the requirements of 35 U.S.C. §102 and is patentable thereunder. Likewise, independent claims 6 and 8 recite similar relevant features as recited in claim 1. As such, the Applicant submits that independent claims 6 and 8 are also not anticipated by the teachings of Tokito and also fully satisfy the requirements of 35 U.S.C. §102 and is patentable thereunder.

Furthermore, dependent claims 2-4, 7 and 9 -12 depend either directly or indirectly from independent claims 1 and 8 and recite additional features therefor. As such and for at least the reasons set forth herein, the Applicant submits that dependent claims 2-4, 7 and 9 -12 are also not anticipated by the teachings of Tokito. Therefore the Applicant submits that dependent claims 2-4, 7 and 9 -12 also fully satisfy the

335742\_1

Response  
Serial No. 09/435,668  
Page 10

requirements of 35 U.S.C. §102 and are patentable thereunder.

### CONCLUSION

Thus the Applicant submits that none of the claims, presently in the application are anticipated under the provisions of 35 U.S.C. §102. Consequently, the Applicant believes that all of these claims are presently in condition for allowance. Accordingly, both reconsideration of this application and its swift passage to issue are earnestly solicited.

If however, the Examiner believes that there are any unresolved issues requiring adverse final action in any of the claims now pending in the application, it is requested that the Examiner telephone Eamon J. Wall, Esq. at (732) 383-1438 so that appropriate arrangements can be made for resolving such issues as expeditiously as possible.

Respectfully submitted,



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